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# Sense



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# 1. Introduction

## 1.1 Product description

The product is an air handling unit for decentralized ventilation. It is available in two different sizes and in variety of different heating possibilities.

## 1.2 Intended use

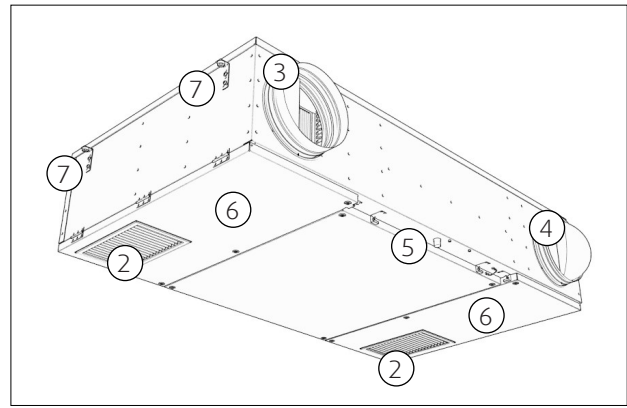
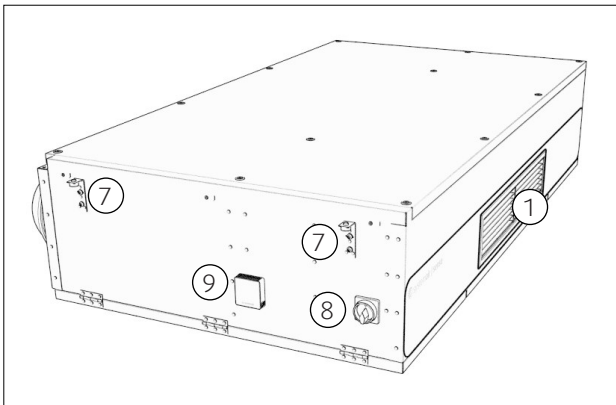
The product is intended for installation in indoor environments connected to a duct system. The air supply and the extract air intake is provided with protection grille. The product is used for transportation of clean air in temperatures between -25-40 °C and installed in an environment in temperatures between 5-40 °C. The product is not applicable for transportation of air that contains explosive, flammable or aggressive media. The product is not applicable for locations where there is a risk of explosion. The product is supplied with control system and constant air volume regulation (CAV).

## 1.3 Document description

This document contains instructions for installation and commissioning of the product. All procedures should be done by approved personnel only. For more questions on installation or commissioning please speak with your Systemair sales office.

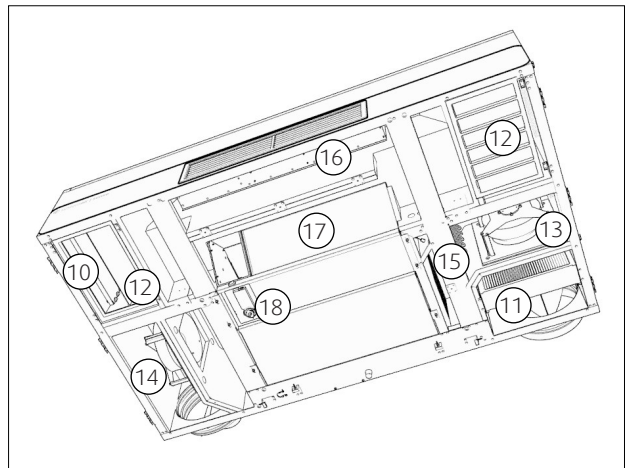
## 1.4 Product Overview

External components



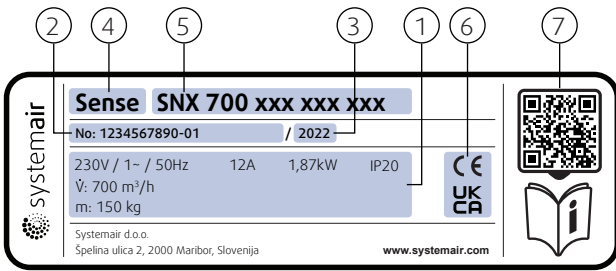
Position	Description
1	Supply air grille
2	Extract air grille
3	Outdoor air spring damper
4	Exhaust air spring damper
5	Drainage connection
6	Commissioning door
7	Mounting bracket (4 for SNX 700 and 6 for SNX 1000)
8	Safety switch
9	CO2 sensor (optional)

Internal components



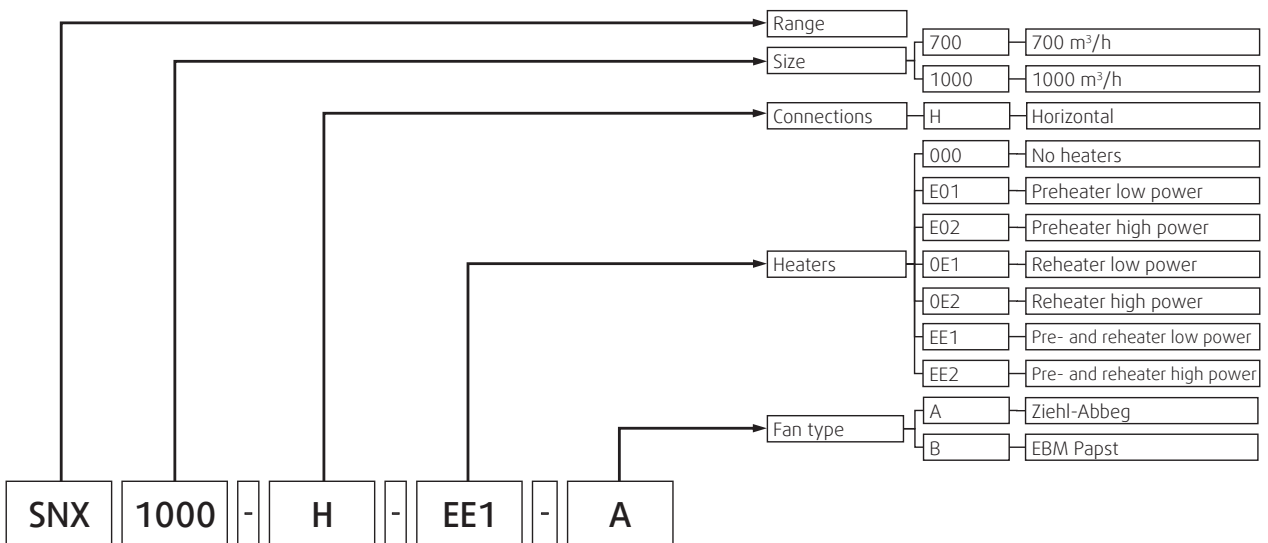
Position	Description
10	Control cabinet
11	Supply filter
12	Extract filter (2x)
13	Supply fan
14	Extract fan
15	Electric preheater (optional)
16	Electric reheater (optional)
17	Heat exchanger
18	Bypass actuator

## 1.7 Name plate



Position	Description
1	Product data: electrical data, nominal airflow and product weight
2	Product serial number
3	Year of production
4	Product name
5	Product designation, size and heating type
6	Certifications
7	QR - Scannable code

## 1.8 Type designation



## 1.9 Electrical technical data

The product has IP20 rating. All cables are halogen-free (EN 61034-2:2005).

The specific electrical data for each product is available for the customer:

- In selection tool printout,
- on the product name plate,
- in the brochure,
- on Systemair website.

## 2. Safety


### 2.1 Safety definitions

**Warning**  
If you do not follow these instructions, there may be a risk of injury to the user.

**Caution**  
If you do not obey these instructions, there is a risk of damage to the product, other materials or the adjacent area.

**Note**  
Information that is necessary in a given situation.

## 2.2 Safety instructions








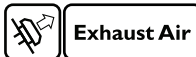
**Warning**  
Read the warning instructions that follow before you do work on the product.



**Caution**  
It is recommended that installation and commissioning of the unit is done after all construction and cleaning of the construction site is finished to keep the product and its filters protected from dust..

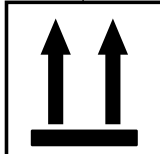
- Obey local conditions and laws.
- The ventilation contractor and the operator are responsible for correct installation and intended use.
- The instructions, electric diagrams and other data must be kept accessible to the personnel operating the unit.
- Do not install or operate the product if it is defective.
- Do not remove or disconnect safety devices.
- Make sure that you can read all warning signs and labels on the product when it is installed. Replace labels that have damage.
- Only permit approved personnel to work on the product and to be in the adjacent area during all work on the product.
- Make sure that you know how to stop the product quickly in an emergency.
- Use applicable safety devices and personal protective equipment during all work on the product.
- Before you do work on the product, stop the product and wait until the fan impeller stops. Make sure that there is no voltage on the motor terminals.
- If the maintenance is not correctly and regularly done, there is risk of injury and damage to the product.
- Only do the maintenance as given in this manual. Speak to Systemair technical support if other servicing is necessary.
- Always use spare parts from Systemair.
- The product is not to be used by persons, including children, with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction.
- Do not allow children to play with the device.
- Upon the completion of work on or inside the unit, the product must be cleaned and restored to the condition prior to the intervention.
- The manufacturer reserves the right to modify these instructions without prior notice.

## 2.3 Warning signs

Sign	Description
	<b>Read the manual, appliance with voltage, rotating parts inside</b> Attached to the side of the product.
	<b>Grounding cable</b> Attached on the bottom at the back of the product at each panel.
	<b>High voltage</b> Attached to the electric cabinet from the side, seen when filter is removed.
	<b>Warning (heat exchanger can fall during deinstallation of the profile)</b> Attached to the profile holding heat exchanger inside of the product.
	<b>Outdoor air</b> Attached to the back of the product next to connection.
	<b>Exhaust air</b> Attached to the back of the product next to connection.


## 2.4 Transport safety instructions

①




**THIS SIDE UP**

②




**HANDLE WITH CARE**

③



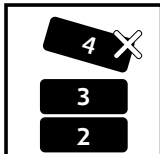
**FRAGILE**

④




**KEEP DRY**

⑤



**MAX 3 CARTOON**

⑥



**ONLY USE THE TROLLEY**

Position	Description
1	<b>THIS SIDE UP</b> The product is assembled and packed upside down and is not allowed to be turned during transportation.
2	<b>HANDLE WITH CARE</b> The product is made from RAL 9010 prepainted AlMg3 and can be damaged if not handled properly.
3	<b>FRAGILE</b> Due to AlMg3 casing there can be damages on paint and also on casing.
4	<b>KEEP DRY</b> After the product reaches final destination the foil should be removed and kept in dry area.
5	<b>MAX 3 CARTOONS</b> No more than 3 packages of the same size are allowed to stand one another at any time.
6	<b>ONLY USE THE TROLLEY</b> For moving the package trolley or forklift are allowed.

## 2.5 Personal protective equipment

Use personal protective equipment during all work on the product.

- Approved eye protection
- Approved protective helmet
- Approved hearing protection
- Approved protective gloves
- Approved protective shoes
- Approved work clothing

## 3. Transportation and storage



### Warning

Be careful during transportation of the product. The product is heavy and there is a risk of injury if it falls.



### Warning

Make sure that the product does not become damaged or wet during transportation. A damaged or wet product can cause fire or electric shock.

When transporting the units use a forklift placed on the gable of the unit.

- Load and unload the product carefully.
- Before the product is moved to the installation location, examine the packaging for damages.
- Keep the correct side of the packaging up during transportation. Refer to the arrows on the packaging.
- Do not loosen packing belt or the transport screws until the product is on location for installation.
- If lifting equipment is used, make sure that the lifting equipment can hold the weight of the product. Refer to the name plate for information. Do not lift the product by the packaging.



### Warning

Do not walk or stand below a lifted product.

- Keep the product in a dry and clean location during storage. Make sure that the ambient temperature during storage is between  $-15$  and  $+40$  °C. A stable ambient temperature prevents damage from condensation.
- Put covers on the duct connections and grilles during storage.

## 3.1 To unload the product

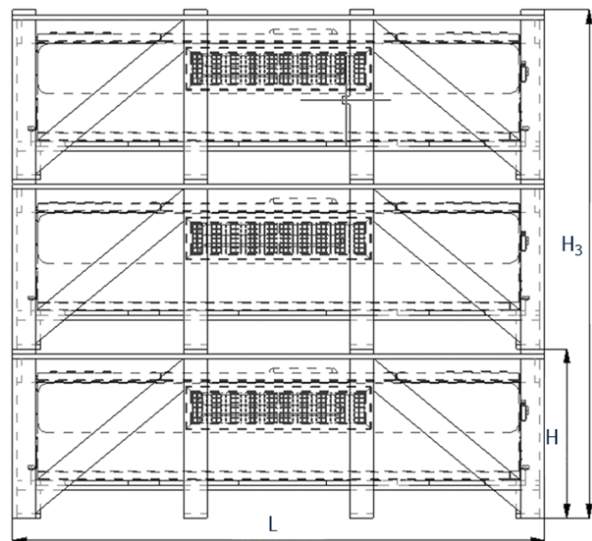
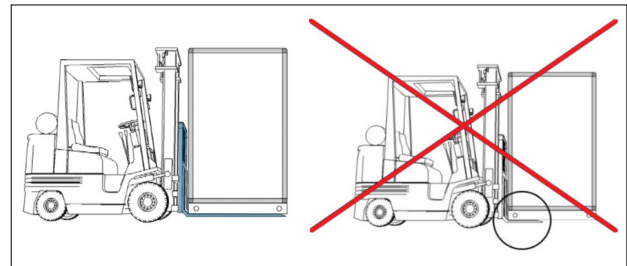
The unit is delivered in one piece standing on a closed pallet for easy transportation using a forklift. The appliance is delivered complete with all necessary components, wrapped in plastic.

At delivery the unit is fastened to the pallet with mounting brackets. Unscrew the brackets from the pallet and fastened them on the unit's upper side for installation in ceiling. Do not lift the unit in the mounting brackets, they are only intended for mounting.



### Warning

Make sure that the forks of the forklift truck or a pallet lift has sufficient length and width.



	Single unit package			Tripple package
	B [mm]	L [mm]	H [mm]	H <sub>3</sub> [mm]
SNX 700	1440	2240	715	2145
SNX 1000	1540	2440	835	2505

## 4. To store the product

The unit should be stored and transported in such a way that it is protected against physical damage that can harm panels, handles, display etc. It should be covered so that dust, rain and snow cannot enter and damage the unit and its components.

## 5. Installation

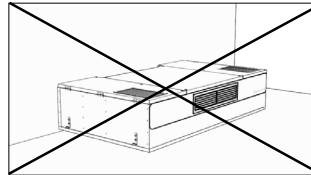
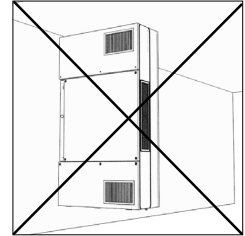
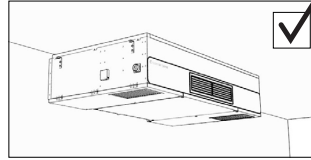
### 5.1 To do before the installation of the product

- Make sure that you have the necessary installation accessories.
- Use installation material with fire resistance rating for the installation location.
- Examine the packaging for transportation damage and remove the packaging from the product carefully.
- Examine the product and all components for damage.
- Install the product in a location where there is space for commissioning, troubleshooting and maintenance.
- Make sure that the installation location is clean and dry, for full safety during electrical work.
- Make sure that the installation surface has sufficient capacity to hold the weight of the product.
- Refer to the airflow direction arrows on the name plate or on the product to install the product in the correct position.
- Make sure that all cable glands are tight against the cables to prevent leaks.

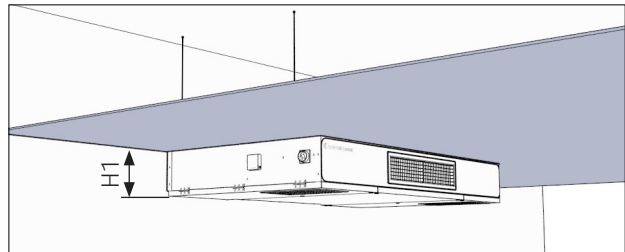


#### Warning

Install the product in horizontal position with the drainage pipe and drip tray pointing down.



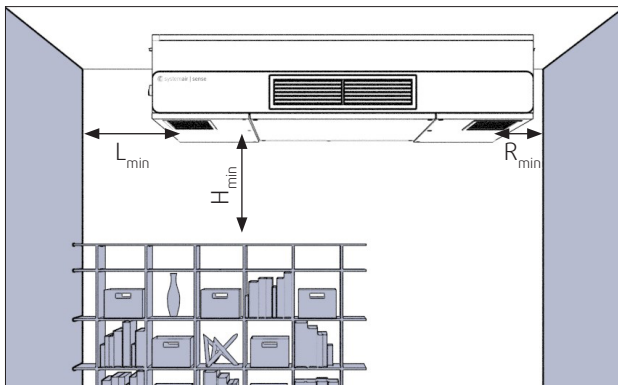
If the product is built in to the false ceiling: Make sure that it is possible to access all control devices and labels.



Unit	H1 [mm]
SNX 700	255
SNX 1000	325

### 5.2 To plan product installation

The product can be installed on the inner ceiling using the mounting brackets that are provided with the product. Make sure that the distances agree with the specifications in the table.



Unit	L <sub>min</sub> [mm]	R <sub>min</sub> [mm]	H <sub>min</sub> [mm]
SNX 700	500	100	550
SNX 1000	500	100	650

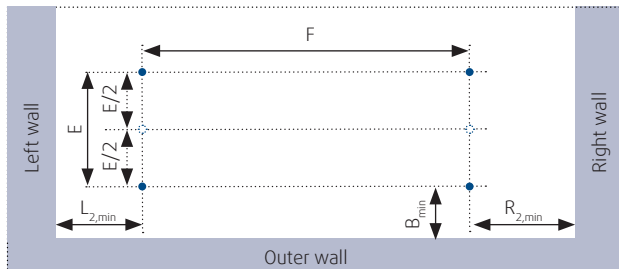


## 5.3 To install the product

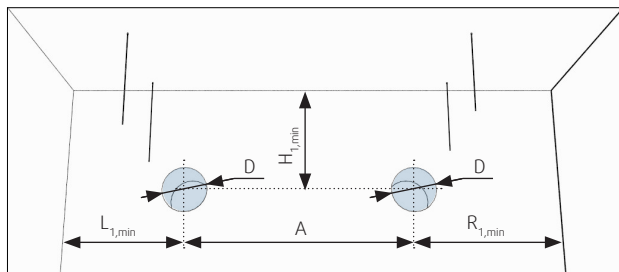
For the installation on the wall measure the location and size of the holes carefully:

- two wall openings for duct connections
- four drill holes (six holes for SNX 1000) at the ceiling for unit installation (drill points marked in red).

Position of drill holes in the ceiling



Position of wall openings



		SNX 700	SNX 1000
A	mm	1616	1800
B <sub>min</sub>	mm	152	152
D	mm	315	315
E	mm	846	996
F	mm	2080	2350
H <sub>1,min</sub>	mm	225	285
L <sub>1,min</sub>	mm	732	775
R <sub>1,min</sub>	mm	332	375
L <sub>2,min</sub>	mm	475	475
R <sub>2,min</sub>	mm	75	75



### Caution

Dimension B<sub>min</sub> only corresponds to installation where unit leans on the back wall.

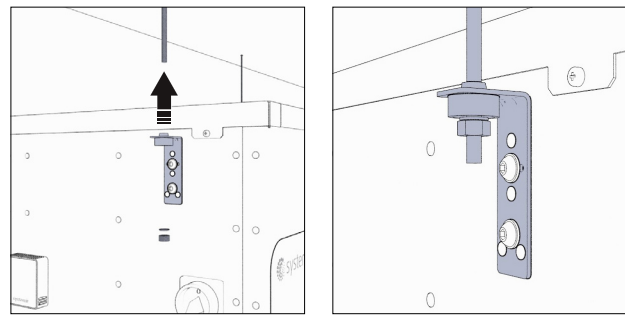
First drill the holes into the wall for connection. After that, drill the holes to the ceiling.

### Note

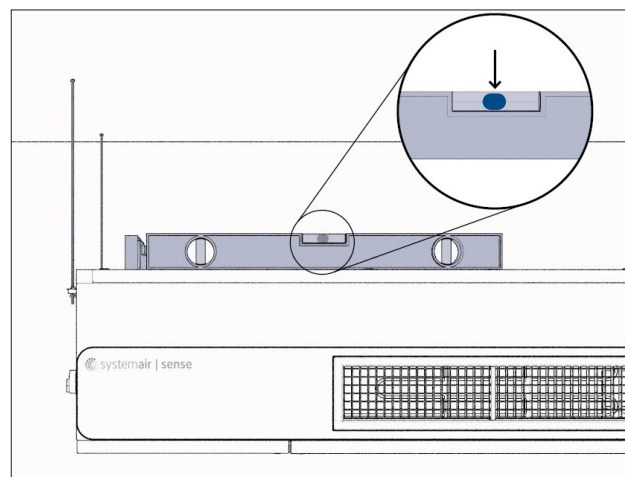
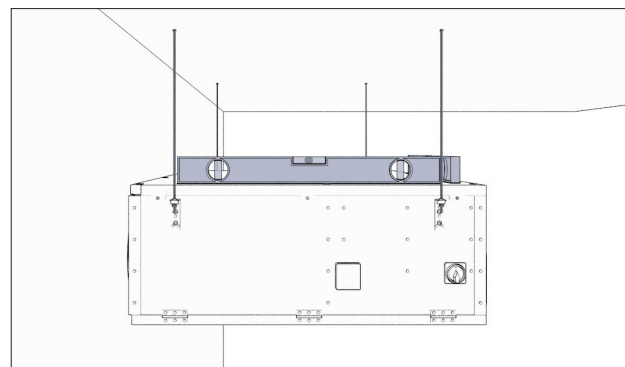
M8 threaded rods with a distance of 500 mm is available as accessory.

### Note

Opening the unit before installation is not required.



1. Unpack the product and place the product in the correct installation position.
2. After the holes are drilled into the ceiling, install threaded rods in length required for the specific room.
3. Gently lift the units from below. Use protective clothing, so the unit's surface does not get damaged.
4. Set the unit to required height with threaded rods inside the brackets.
5. Install the washer and nut to bracket from below.



## 5.4 To connect the product to the main power supply



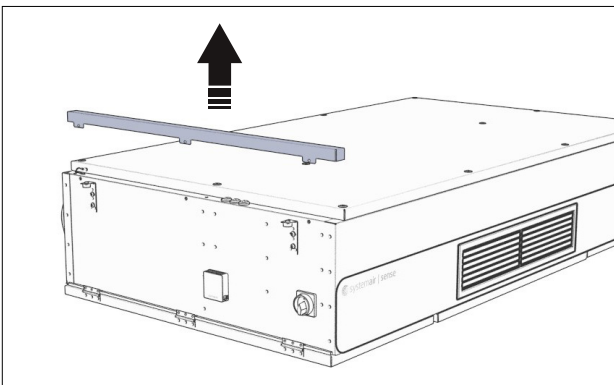
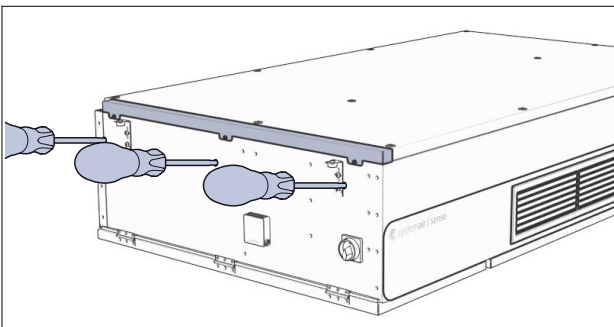
### Warning

All the work on or around controls or wiring must be carried out with the power supply switched off.

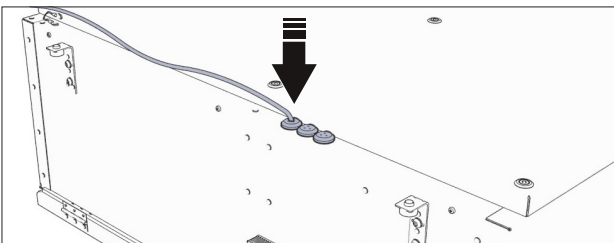
### Note

Electrical connection must only be carried out by qualified personnel

1. Remove the three screws and open the protective cover for the cable installation.



2. Lead the main power supply and HMI display cable into the electrical cabinet through the electrical glands.



3. Fit the protective cover back in its original place and tighten it with the screws.

### Note

The connection of the main electrical supply must be made in accordance with the electrical diagram. **See chapter 11. for more information on the electrical connection.**

## 5.5 To connect the ducts to the product

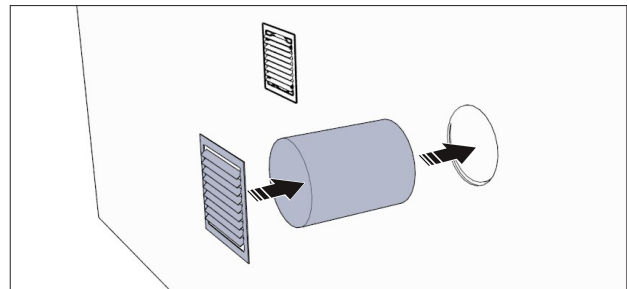
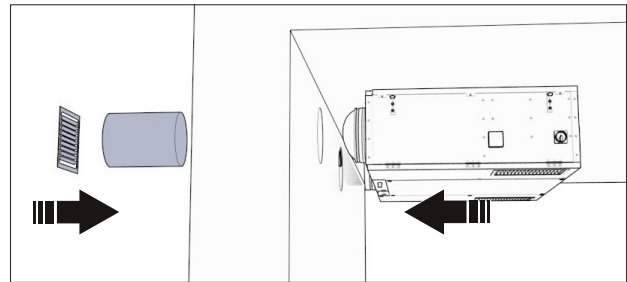
### Note

Duct connections are installed only on the back of the unit. Installation of the unit can be done with back leaning on the wall or away from the wall.



### Caution

Should the installation require additional ducting work to the wall, these ducts need to be installed with additional sound insulation to keep unit's quiet operation.



## 5.6 To connect the drainage onto the product

The unit has a drip tray on the outer side on heat exchanger's extract air with drain pipe dimension of 18 mm.

### Note

It is recommended to connect the drip tray drainage to the waste water pipe where possible. Alternatively the drain can be led over the wall or to the roof with the help of the drain pump.



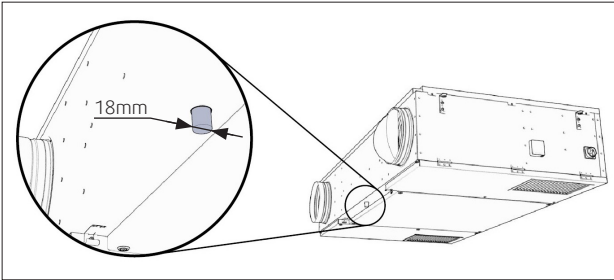
### Caution

The unit drainage is in underpressure between 50 and 400 Pa, depending on operation, so underpressure siphon is required for normal operation. Refer to 5.7 to connect the wall siphon to the product.



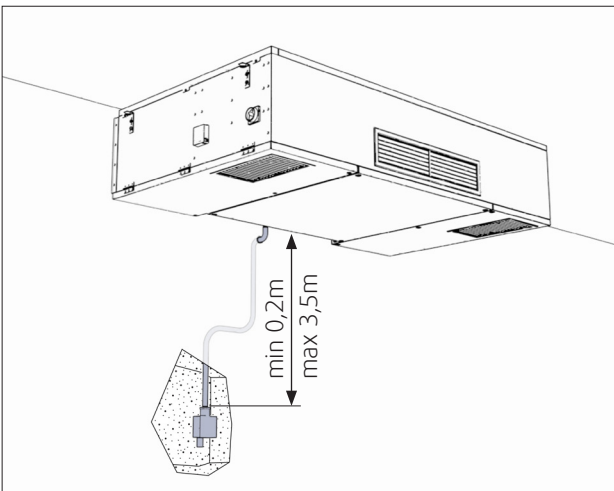
### Caution

When drainage is led outdoor be sure to protect the hose against freezing.

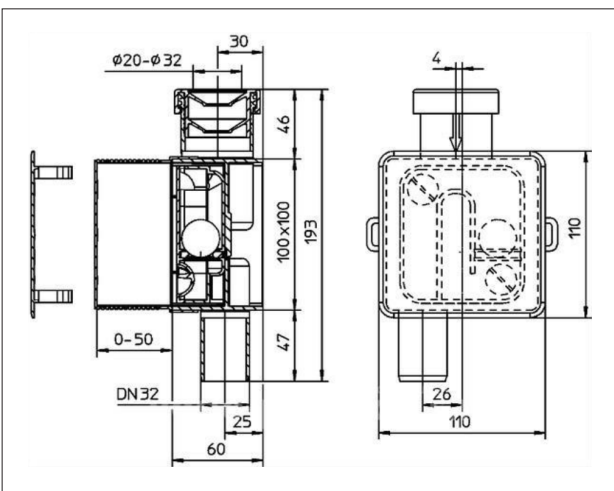


## 5.7 To connect the wall siphon to the product (accessory)

The best position is to install it into the wall with a cover left for commissioning, should it ever be needed. Check Appendix 1 for list of accessories.



Siphon dimensions

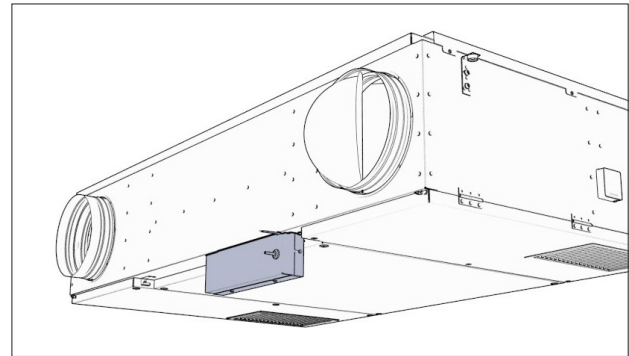


For more information on siphon installation, see the instructions included with the siphon.

## 5.8 To install the drain pump to the product (accessory)

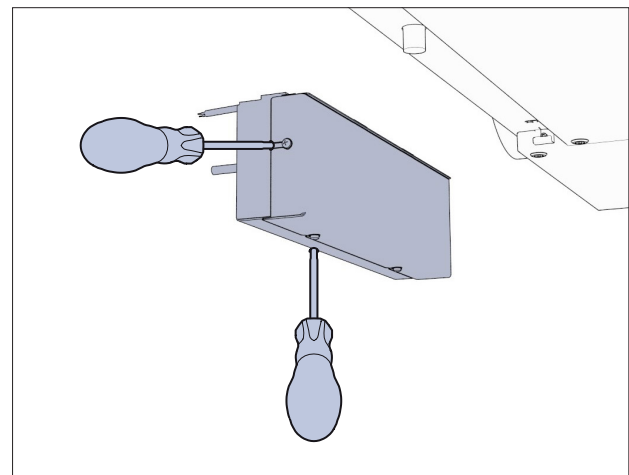
The drain pump is bought as a preinstalled kit that needs only to be attached to the unit with predefined holes on the product.

lead the electric cable for the drain pump trough the cable gland (mention where the cable gland is located) and the insulation, and connect the cable in the prepared connection box inside the product. Install water drainage on the back side of the product.

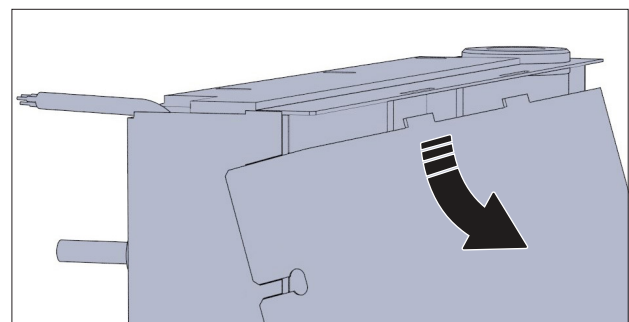


### Pump installation

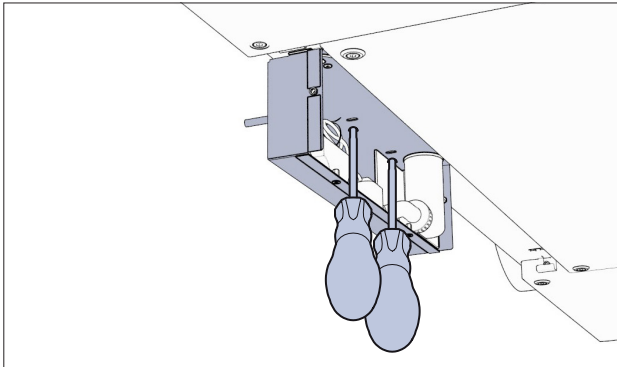
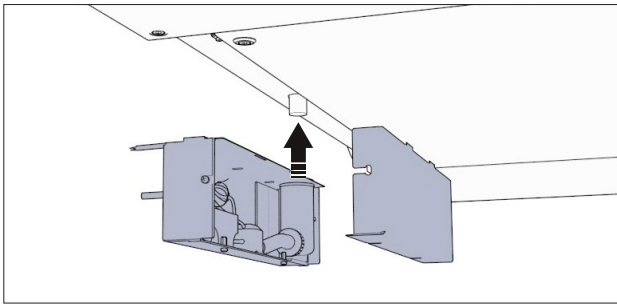
Open the accessory package containing drainage pump. Loosen the screws of preinstalled kit, securing the pump housing cover.



Remove the cap on the pump casing by pulling the cover vertically from the notches.

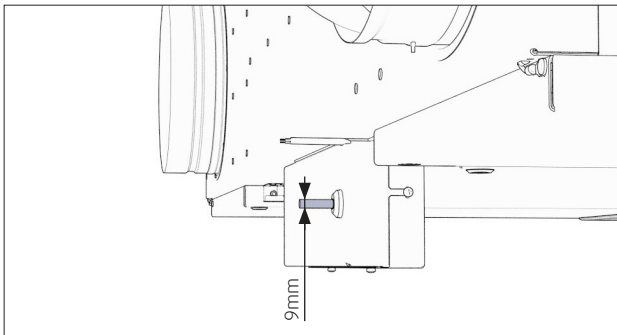


Fit the pump with vertical thrust, coaxial with condensate drain connection in the direction of the unit casing. Fasten the pump casing onto the unit casing.



Insert the power cord through the opening on the casing of the unit and into the electrical box. Connect the power cable into the electrical box inside the unit.

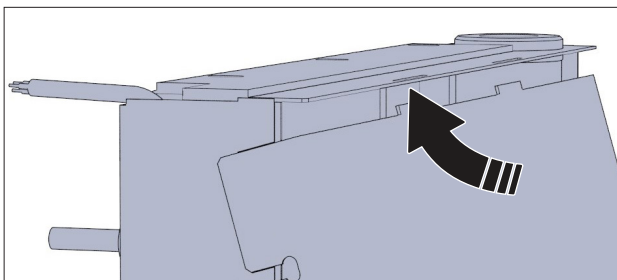
Attach the drain hose to the pump connection.



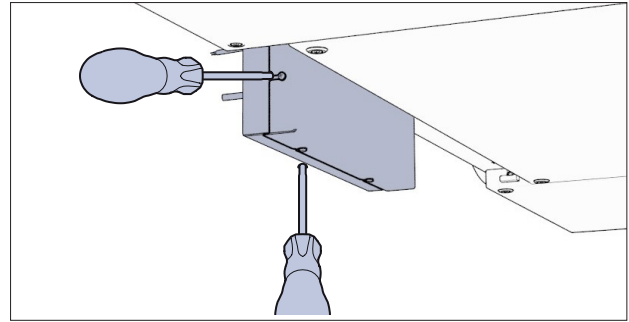
**Note**

If the unit is installed on the wall, drainage pipe needs 10 x 10 mm duct inside a wall so it can get to the ceiling.

Reattach the pump casing cover and tighten it with the screws.



Tighten the cover with screws.



**5.9 To adjust supply air grille**

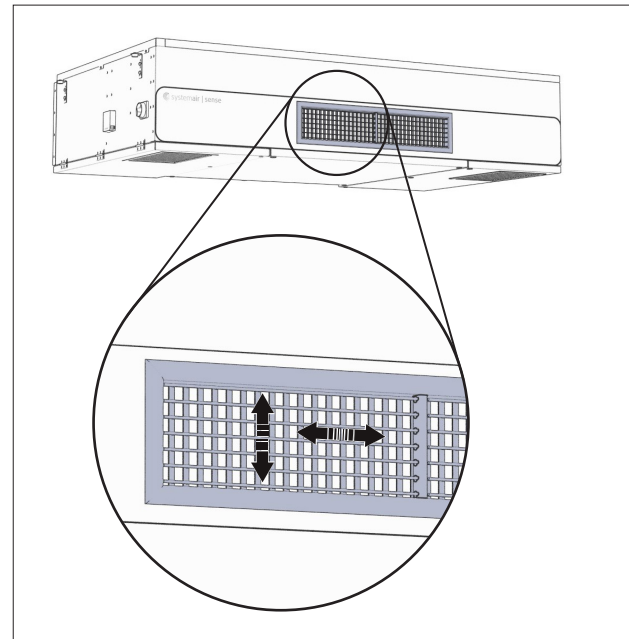
The supply air grille blades can be manually turned blade by blade to allow customer to optimize direction of airflow.

1st row of blades are vertical and allow following:

- the spread the airflow to shorten the air throw distance and lower supply air velocity,
- turning blades into same direction to force supply air direction diagonally over room

2nd row of blades are horizontal and allow following:

- turning blades slightly up to create Coanda effect (ceiling effect).



## 6. Commissioning

### 6.1 Description of internal components

#### Fans

Both, supply and extract, fans have external rotor motors of EC type which are steplessly controlled individually by setting the control signal to a fixed value. Fans are set to preconfigured 3 steps (minimum, medium, nominal) with boost setpoint. All 3 steps are possible to be reconfigured depending on the programming of the week schedule. The motor bearings are life time lubricated and maintenance free. It is possible to remove the fans for cleaning.

#### Filters

Due to geometry of the product and optimization of the internal airflow, the product consists of three filters. Out of those one is supply air panel filter with filter quality ePM1 60% (F7). The other two are symmetrically positioned extract air bag filters with filter quality ePM10 60% (M5). The filters need to be replaced when polluted either with maximum pressure drop on supply filter or within one year, whichever happens first. The HMI display will show alarm when this happens. New sets of filters or higher quality filters can be acquired from your installer or wholesaler.

#### Heat exchanger

Units are equipped with a counter flow heat exchanger and a by-pass damper. The operation of the bypass damper is automatic and depends on the set temperature or if deicing is in operation. The heat exchanger is removable for cleaning and maintenance.

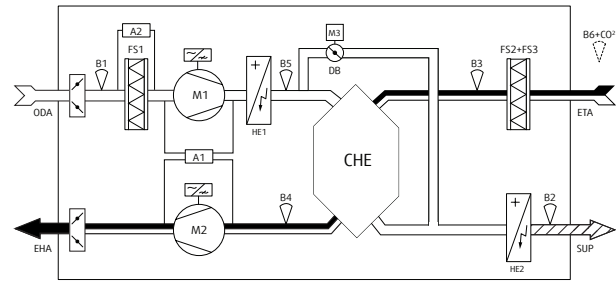
#### Electrical heater (optional)

In air handling units with built in electrical preheater the heating rods are located between the supply air fan and heat exchanger in the airflow direction. In units with built in electrical reheater the heating rods are located between heat exchanger and supply air grille in the airflow direction. The material is stainless steel. The electrical heating battery has both automatic and manual overheating protection. The manual overheat protection is reset by pushing the red button on top of the electrical heater frame. The power demand of the electric heating coil is controlled by the main regulator, which controls the heat steplessly by a TTC triac control according to the selected control function that is set in the control panel.

#### Pressure sensors

Two pressure sensors are installed, each of the sensors has two functions. One function (A1) is to measure the differential pressure over the inlet cone of the fan impellers to maintain the airflow at constant level (CAV function as standard). The other function (A2) is to measure the dynamic differential pressure over the supply

air filter so that when the pressure drop reaches the set value, an alarm is triggered in the main regulator, which indicates that the filter needs to be replaced.



#### Temperature sensors

Four temperature sensors (NTC 10K) are included in the unit from factory as standard. Additional two sensors come in case preheater is selected or CO<sub>2</sub> sensor is added. The sensors are as follows:

- (B1) Outdoor air temperature sensor
- (B2) Supply air temperature sensor
- (B3) Extract air temperature sensor
- (B4) Exhaust air temperature sensor
- (B5) Electrical preheater limiting sensor (options E01, E02, EE1, EE2)
- (B6) Room temperature sensor (optional only with CO<sub>2</sub> sensor)

#### CO<sub>2</sub> sensor (accessory)

CO<sub>2</sub> sensors are used mainly for demand-controlled ventilation to prevent energy losses from over-ventilation while maintaining indoor air quality. Considering the installation of the product, positioning of the sensor will always be more than 2m above the floor. Should the customer want to install wall sensor, they can connect it to controller inside electric cabinet on their own.

#### Free cooling

This function is used during the warm period to save energy by using cold outdoor air, e.g. during nighttime, to cool down the building and thereby reducing the need for cooling during the day time.

Activation of the function occurs, when

- Outside air (TOa) is sufficiently low compared to the apartment temperature (extract or room),
  - and apartment temperature is above its actual setpoint + configurable hysteresis,
  - and outside temperature is above set minimum limit
- and free cooling is configured.

For deactivation a hysteresis of 2K (fix) is used. During activation, the operating mode is set to Comfort and kept there until one of the activation criteria is no longer fulfilled. In case of cascade control, the actual room temperature setpoint (depending on the operating

mode) is used. As there is no room temperature setpoint available for supply air control, a configurable virtual room temperature setpoint is used.

### Defrosting

Detecting ice on the heat exchanger or in the ductwork is possible with exhaust air temperature sensor. Defrosting with exhaust air temperature sensor starts when temperature is below the limit.

Defrosting is possible by:

- Opening the by-pass damper, so that the exhaust temperature increases.
- Reducing the supply fan speed, so that the load of cold air incoming is reduced, increasing the exhaust air temperature.
- PI control exhaust temperature to maintain a minimum exhaust temperature.
- Preheating the outside air, increasing the exhaust air temperature

Standard mode for defrosting is opening bypass damper and reducing supply fan speed. During defrost, the by-pass damper is opened to a configurable value. For open/close controlled dampers, the value should be set to 100%.

During deicing the by-pass damper, fan speed for supply fan and exhaust fan are set to configurable values. For faster defrosting, it is possible to set the supply fan speed setpoint even to 0%. In this case electric heaters in the supply air are blocked.

For defrost, there is also possible to set in ABT GO one of the possible modes:

- No defrosting
- Increase by-pass damper position to a fix value
- Increase damper and reduce fan speed
- Increase damper and increase preheating
- Increase damper, reduce fan speed and increase preheating
- ERC maintain minimum exhaust temperature\*
- Maintain exhaust temperature and reduce fan speed\*
- Maintain exhaust temperature and increase preheating\*
- Maintain exhaust temperature, reduce fan speed and increase preheating\*

## 6.2 Maintenance intervals

The table below shows recommended maintenance intervals for the product. To ensure a long operation lifetime for the product it is important to perform maintenance according to below recommendations or in accordance with local rules and regulations. Maintenance must be performed according to the operation and maintenance instructions. A thorough and recurrent maintenance is a must for a valid guarantee.

Activity	Time frame					Comment
	1	3	6	12	24	
<b>Casing and system</b>						
Inspection of soiling, damage and corrosion on casing				X		
Inspection of internal mesh parts and cleaning				X		
Inspection of dirt on outdoor louvres and cleaning				X		
Inspection of dirt on indoor grilles and cleaning				X		
<b>Fans</b>						
Inspection of soiling, damage and corrosion				X		
Clean the fan parts in contact with air				X		
<b>Filters</b>						
Check for a pressure drop	X					Only after start up
Inspection of contamination and damage	X					Only after start up
Replace the filters						When indicator shows
<b>Plate heat exchanger</b>						
Inspection of soiling, damage and corrosion					X	
Inspect the sealing of the air partition walls					X	
Cleaning					X	
Carry out a functional test of the by-pass				X		
Carry out a functional test of the syphon				X		
Carry out a functional test of the drain pump				X		
<b>Electric preheater and reheater</b>						
Inspection of soiling, damage and corrosion			X			
Inspection of operation of heater elements			X			

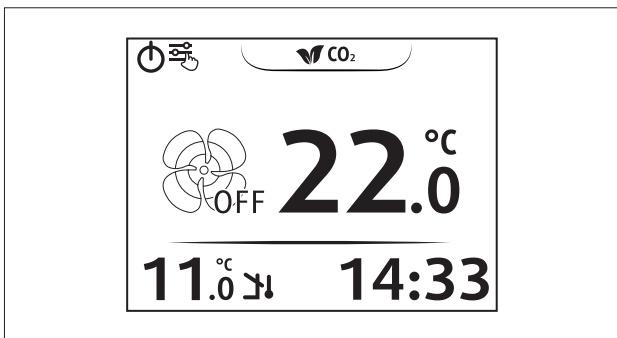
### 6.3 To do before maintenance



#### Warning

Turn the unit off with a main switch and wait for minimum of five minutes before starting to working on the unit.

Indication that the unit is not working, can be seen on the HMI when the icon on it shows:

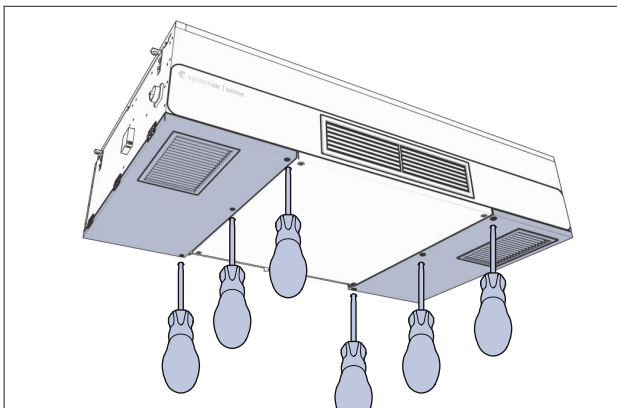


### 6.4 To open the product

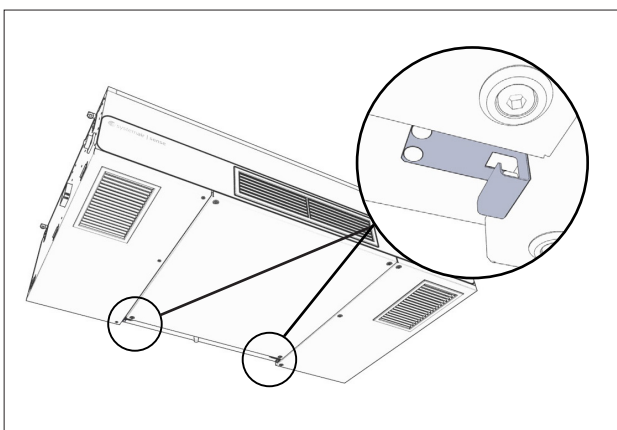
#### To open left and right door

Only one service technician is needed for opening door.

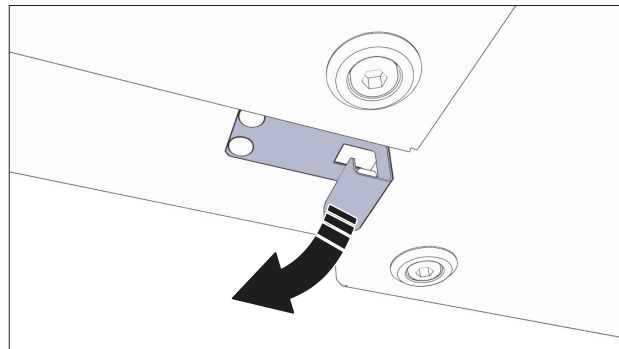
1. Remove all 3 screws on each door. Use M6 imbus tool.



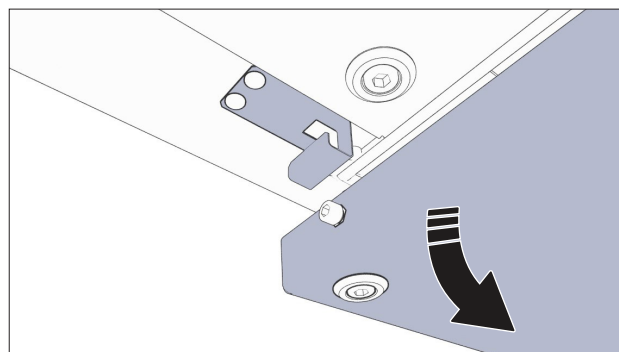
2. On the back side near wall see the blocking element.



3. Pull the element towards you to unblock the door.



4. Open the door.



#### Warning

Hold the door at all times before you open it to negate the door falling down.

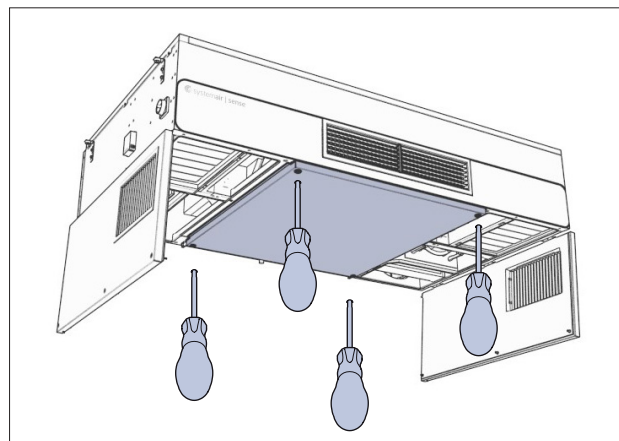
#### To open the control cabinet



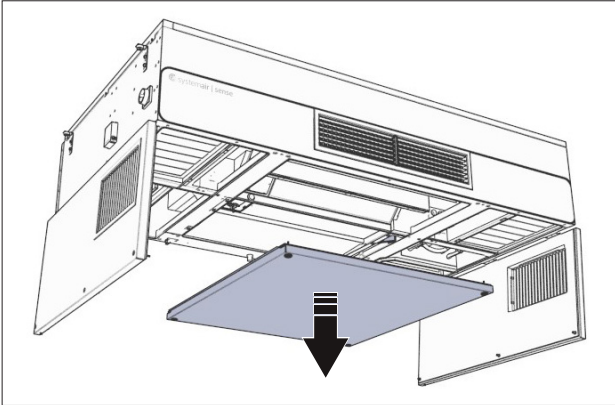
#### Warning

Two service technicians are needed for removing the middle panel.

1. Remove all 4 screws on the panel. Use M6 imbus tool. One person needs to always hold the panel.



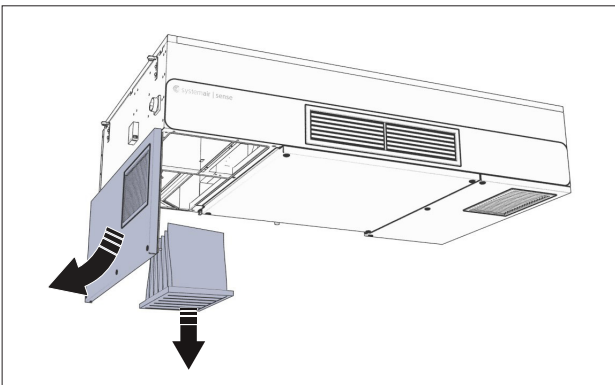
2. Remove the middle panel carefully.



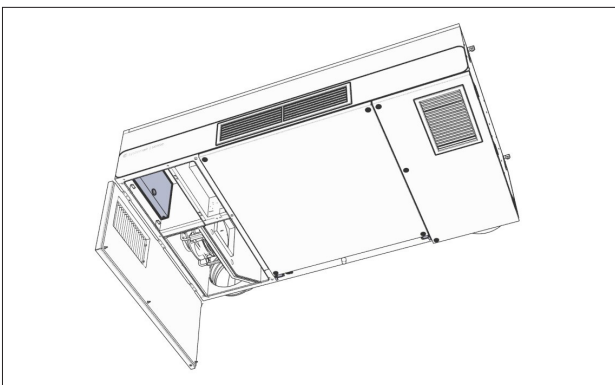
### To open the control cabinet

One service technician is needed for working on control cabinet. It is hidden under the left extract bag filter.

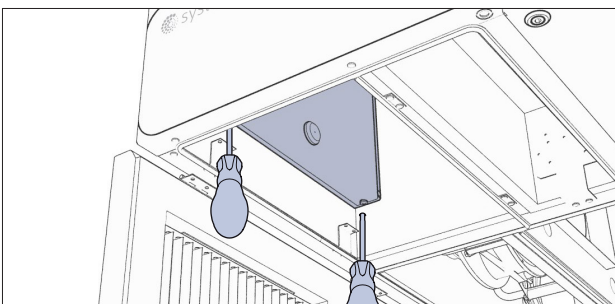
1. Open the left door and remove the bag filter.



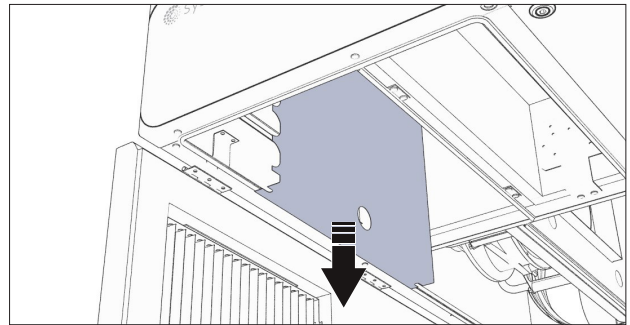
The control cabinet is located in the filter section.



2. Remove two screws on the left and right side of the cabinet.



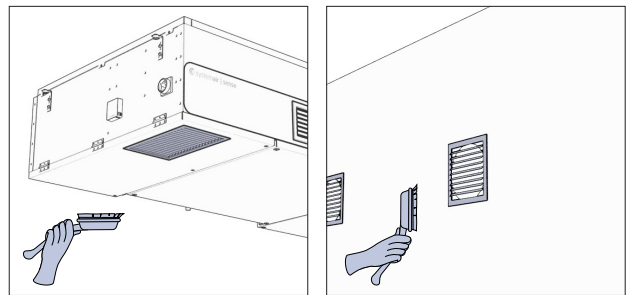
3. Remove the cabinet cover carefully so you do not damage the insulation. Specifically take care on the cover next to the cable glands..



## 7. To check and clean the product

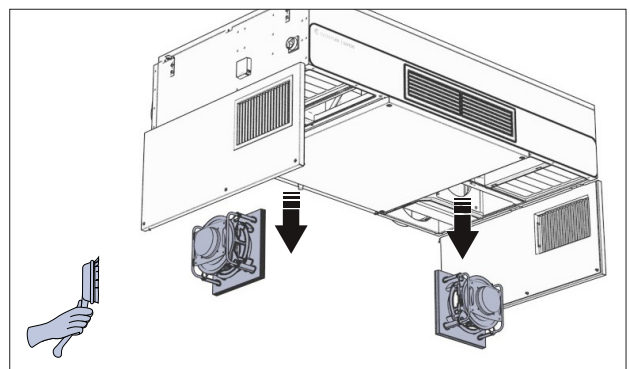
### To clean grilles and louvres

Leaves and pollution could plug up the air intake grille and reduce the unit's capacity. Check the air intake grille at least twice a year and clean if necessary.



The product has installed supply and extract air grilles. After long period of time dust and pollutants can build up on them, especially extract grilles. It is advisable to clean them with a recommended interval of minimum once a year. Do not remove them as you can damage casing paint while doing that. Use cloth or soft brush for cleaning these surfaces.

### To clean the fans



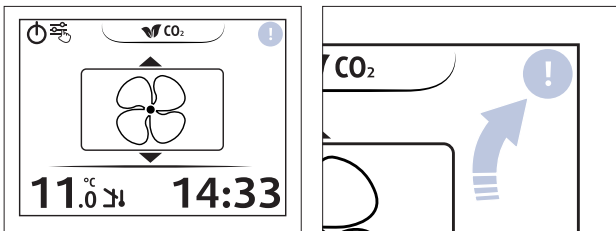
Even if the required maintenance, such as change of filters is carried out, dust and grease may slowly build up inside the fans. This will reduce the efficiency. The fans



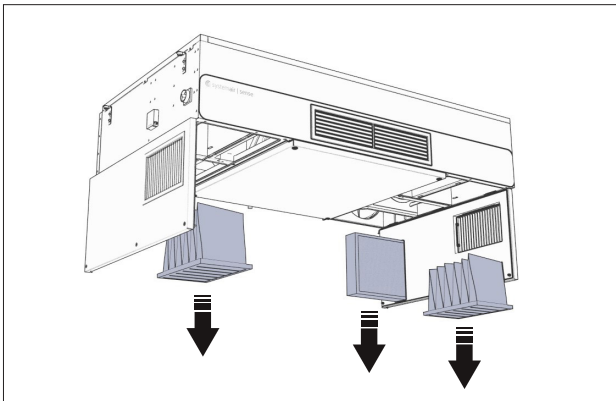
are easily taken out from the unit by loosening 4 screws and disconnecting the fast couplings to the electric wires. Clean the fans with a soft brush with a recommended interval of minimum once a year. Do not use water. Do not use sharp objects as you can damage insulation.

### To change the filters

All three filter cannot be cleaned and must be changed when necessary. New filters can be ordered from Systemair. Operation time between filter changes depends on the air pollution at the installation site. A differential pressure switch indicates when it's time to change the filters. This will trigger an alarm in the control panel.



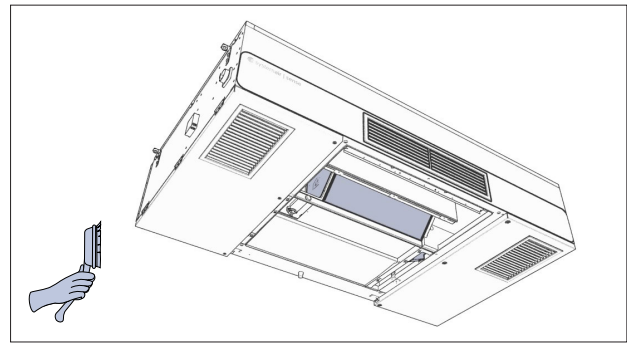
When this occurs do the following:



1. Switch the power supply off and wait for five minutes.
2. Open the door as described in chapter 6.4.
3. Pull the filters out.
4. Replace the filters with new ones. Take care while inserting the left bag filter, to slide it in next to control box.
5. Close the door.
6. In Alarm menu set Acknowledge alarm screen and press OK

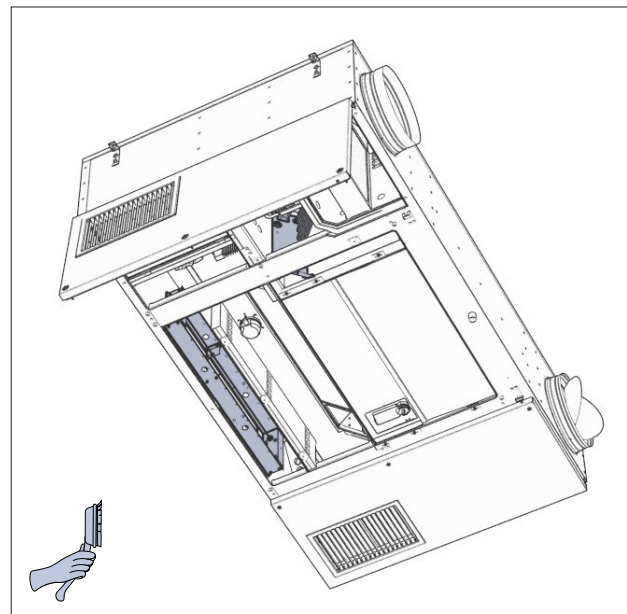
### To clean the heat exchanger

After a long time of use dust may build up in the exchanger and block the airflow. It is important to clean the exchanger regularly (minimum once every two years) to maintain high efficiency. The heat exchanger can be taken out of the unit for maintenance:



1. Switch the power supply off and wait for five minutes.
2. Open the door as described in chapter in chapter 6.4.
3. Take off the middle panel (you need two service technicians to do this safely).
4. Remove the sealant around the drip tray drainage and remove the drip tray.
5. Disconnect the wire connected to by-pass actuator.
6. Remove the cover holding the heat exchanger. Heat exchanger is not fastened, so be sure not to let it drop after cover is removed.
7. Remove the heat exchanger.
8. Wash in hot soapy water or use pressure air. Do not use detergent containing ammonia. Replace the gaskets on the heat exchanger and around the heat exchanger's installation position.
9. After heat exchanger is cleaned, install it back following steps in reverse order.

### Electrical heaters



After long period of time dust and pollutants can build up on the heating rods. This can cause unpleasant odors and in the worst case fire. Clean with compressed air, vacuum or brush. The automatic safety function needs to be tested and verified.

If needed thermostats can be manually reset.

## 8. Troubleshooting

Code	Alarm class	Name/Description	Source	Plant lock	BACnet object / Comment	Influence of alarm	Solution
1001	A	Supply air temperature, sensor fault	System	Stop	TSu	Shutdown AHU	Check connection of sensor and replace if needed
1002	A/B	Exhaust air temperature, sensor fault	System	Run	TEh, active only if sensor available	Shutdown AHU / No heat exchanger supervision possible	Check connection of sensor and replace if needed
1003	B	Extract air temperature, sensor fault	System	Run	TEx, active only if sensor available	Fallback to room temperature control or supply air control	Check connection of sensor and replace if needed
1004	A/B	Outside air temperature, sensor fault	System	Conf.	TOa	Shutdown AHU / fallback to default	Check connection of sensor and replace if needed
1005	A	Frost protection temperature for heating coil, sensor fault	System	Stop	TFRtHcl, active only if HclHW selected	Shutdown AHU, Frost protection mode	Check connection of sensor and replace if needed. Check if there is hot water in pipe system.
1006	B	Relative humidity for extract air, sensor fault	System	Run	HuRelEx, active only if sensor available	Stop Humidity control if all sensors fail	Check connection of sensor and replace if needed
1009	A	Fire damper, position feedback fault	Process	Stop	FdpFb, active only if Fdp selected. Plausibility check of fire damper position feedback	Shutdown AHU	Check if fire alarm signal is connected. Check polarity of that signal.
1012	B	Room temperature, sensor fault	System	Run	TR with POS8/QMX3	Fallback to extract temperature control or supply air control	Check connection of sensor and replace if needed
1013	B	Room air quality, sensor fault	System	Run	AQualR with QMX3 or PmR	Stop air quality control if all sensors fail	Check connection of sensor and replace if needed
1014	B	Extract air quality, sensor fault	System	Run	PmR or AQualR, Particulate matters, Air quality	Stop control if all sensors fail	Check connection of sensor and replace if needed
1015	B	Cooling coil DX evaporator fault	Process	Run	CclDxFIt (BI, active only if CclDx selected)	Switch off cooling device	Check if there is alarm on DX unit. Check polarity of that signal.
1017	B	Room air humidity, sensor fault	System	Run	HuRelR, if configured on QMX	Stop Humidity control if all sensors fail	Check connection of sensor and replace if needed
1018	A/B	Supply air temp. after preheating coil, sensor fault	System	Run	TSuAfPreHcl, active only if sensor available	Shutdown AHU / Shutdown electric preheating coil, fallback value for heat exchanger efficiency	Check connection of sensor and replace if needed
1019	B	Flow temperature preheating coil, sensor fault	System	Run	TFIPreHcl, active only if sensor available	Fallback to default value	Check connection of sensor and replace if needed
1020	B	Air filter, dirty	Process	Run	Operating hours of air filter exceeds limit or delta P, active only if FilA selected	No reaction	Check if filters are clean, if not replace filters with new ones.
1021	B	Supply air temperature after heat exchanger, sensor fault	System	Run	TsuAfHExg, active only if sensor available	Fallback value for Hexg efficiency calculation	Check connection of sensor and replace if needed
1031	A/B/n	Heat Exchanger fault	Process	Run	RoHExgFIt or HExgCdnMon (BI)	Shutdown AHU / Bypass or shutdown HExg / no reaction	Check if bypass damper of Heat Exchanger is opening. Replace actuator if needed.
1032	B	Supply air pressure, sensor fault	System	Run	PSu, active only if VntCtl12 selected	Fallback to extract air control, linear fan speed if all sensors fail	Check connection of sensor and replace if needed. Check if tubes are mounted correctly.

Code	Alarm class	Name/Description	Source	Plant lock	BACnet object / Comment	Influence of alarm	Solution
1033	B	Extract air pressure, sensor fault	System	Run	PEx, active only if VntCtl12 selected	Fallback to supply air control, linear fan speed if all sensors fail	Check connection of sensor and replace if needed. Check if tubes are mounted correctly.
1034	B	Differential pressure supply air fan, sensor fault	System	Run	DiffPFanSu, active only if sensor available	Fallback to linear fan speed, if in air flow control	Check connection of sensor and replace if needed. Check if tubes are mounted correctly.
1035	B	Differential pressure exhaust air fan, sensor fault	System	Run	DiffPFanEh, active only if sensor available	Fallback to linear fan speed, if in air flow control	Check connection of sensor and replace if needed. Check if tubes are mounted correctly.
1037	A/B/n	Supply air fan fault	Process	conf.	Check of fan speed feedback or fault signal	Shutdown AHU / No reaction / No reaction	Check if fan is running. Check if feedback signal is correct when fan is working.
1038	A/B/n	Exhaust air fan fault	Process	conf.			Check if fan is running. Check if feedback signal is correct when fan is working.
1041	A	Frost protection temperature for combined coil, sensor fault	System	Stop	TFrPrTHCl, active only if sensor available	Shutdown AHU, Frost protection mode	Check connection of sensor and replace if needed. Check if there is hot water in pipe system.
1042	B	Combined coil supply water temperature, sensor fault	System	Run	TRtSu, active only if sensor available	Fallback to default heating mode	Check connection of sensor and replace if needed
2001	A	Emergency off	Process	Stop	EmgOff (BI)	AHU off	Check connection on digital input. Check if polarity is ok.
2002	A	Smoke detector	Process	Stop	Smext (BI)	Smoke extract mode	Check connection of sensor and replace if needed
2004	A	Fire alarm	Process	Stop	Supply (TSu) or extract (TEx) air temperature exceeds max. limit	Shutdown AHU	Check if electrical heater is working when fans are off.
2005	A/B/n	Supply air temperature, exceeds operating limits	Process	Run	Supply air temperature (TSu) exceeds min/max limits	Shutdown AHU / no reaction / no reaction	Check if electrical heater is working when fans are off.
2007	A	Heating coil, frost warning	Process	Stop	Temperature (TFrPrTHCl) below frost protection limit, active only if HclHW selected	Shutdown AHU, Frost protection mode: Switch on pump, open valve	Check if there is hot water in pipe system.
2010	A	Heating coil, over temperature	Process	Stop	HclOvrTDet (BI), active only if HclEI selected	Shutdown AHU	Check if electrical heater is working when fans are off.
2012	A	Preheating coil, over-temperature	Process	Stop	PreHclOvrTDet, active only if PreHclEI selected	Shutdown AHU	Check if electrical heater is working when fans are off.
2013	A	Outside air damper stops air flow	Process	Stop	Shutdown AHU	Fallback to linear Fan speed	Check connection of damper and replace if needed
2017	A/B/n	Heat exchanger efficiency supervision	Process	Conf.	Plausibility check of air temperatures	Shutdown AHU / Bypass or shutdown / no reaction	Check if bypass damper of Heat Exchanger is opening. Replace actuator if needed.
2020	A	Combined coil, frost warning	Process	Stop	Temperature (TFrPrTHCl) below frost protection limit, active only if TFrPrTHCl selected and HCl in heating mode	Shutdown AHU, frost protection mode: Switch on pump, open valve	Check if there is hot water in pipe system.
3011	B	Duct pressure sensor, Modbus communication error	System	Run	QBM, active only if device configured	Fallback to linear Fan speed	Check connection of sensor and replace if needed

## 9. Warranty

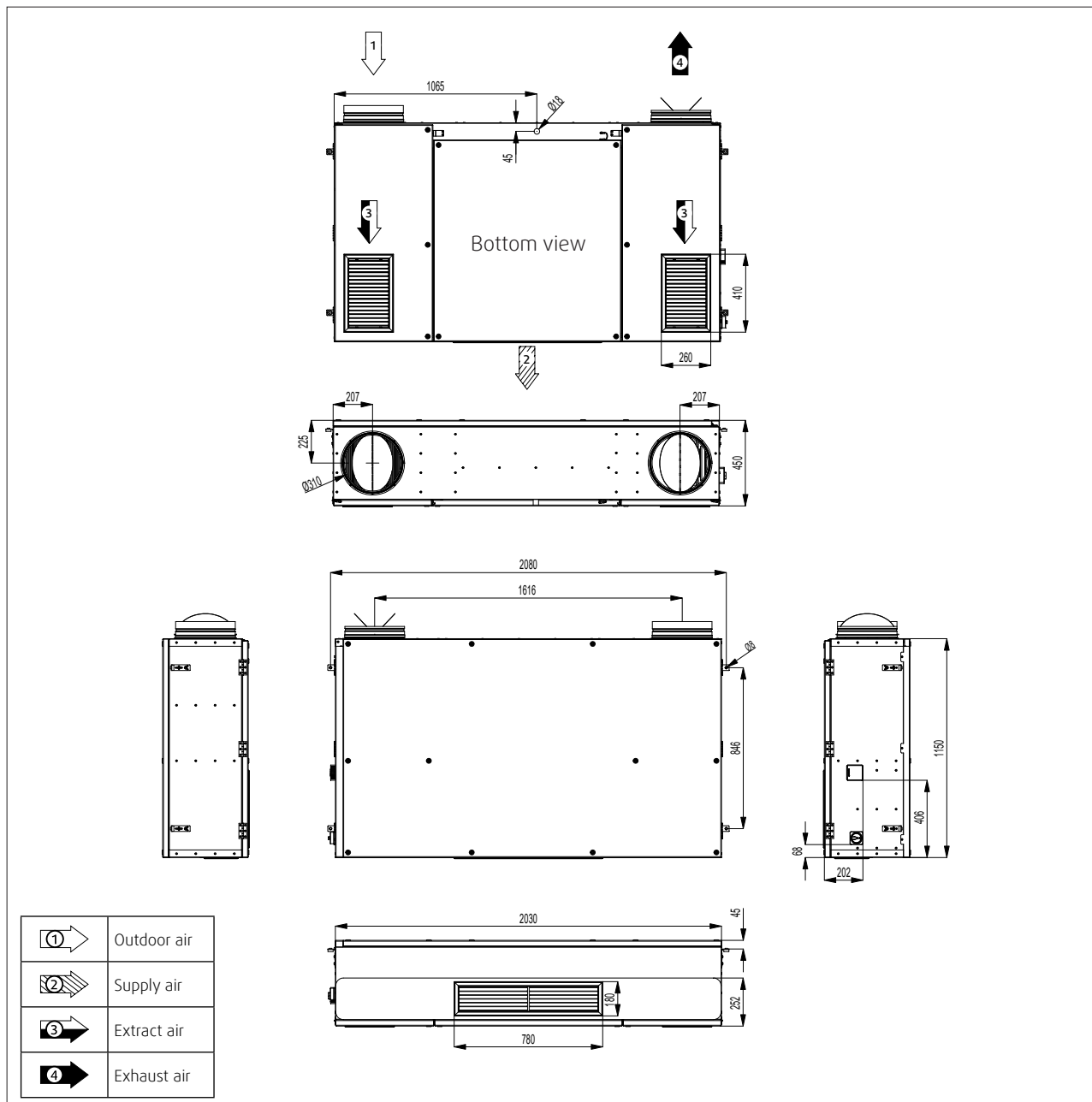
For warranty claims, send a written maintenance plan and the commissioning report to Systemair. The warranty is only applicable for these conditions:

- The product is correctly installed and operated.
- The instructions in the data sheets are obeyed.
- Maintenance instructions are obeyed.
- A product that is not operated continuously is operated for a minimum of 1 hour each month.

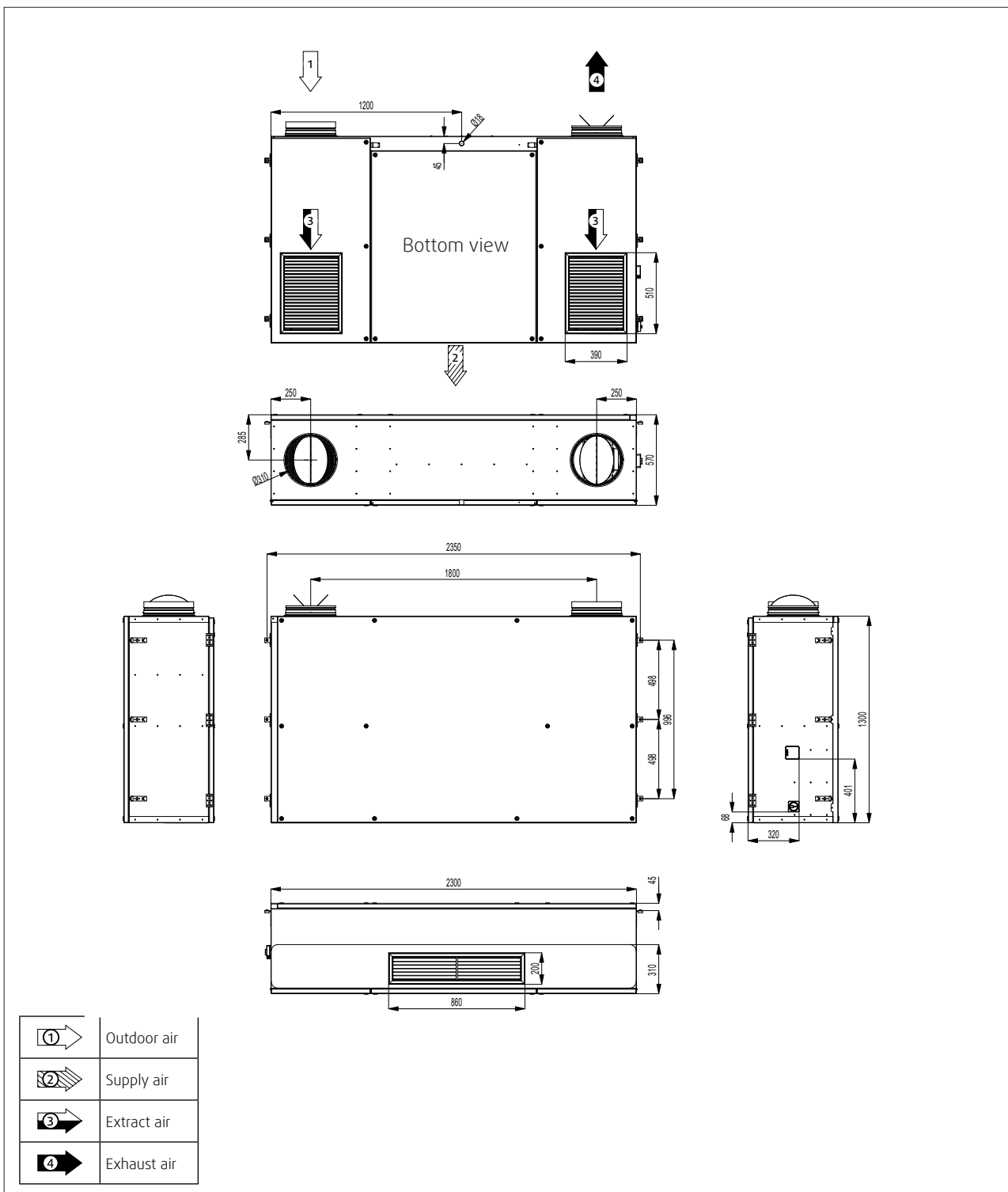
## 10. Technical data

### 10.1 Product dimensions

SNX 700 – all options have same geometry



SNX 1000 – all options have same geometry



# 11. Wiring

Electrical equipment is connected at the control box.



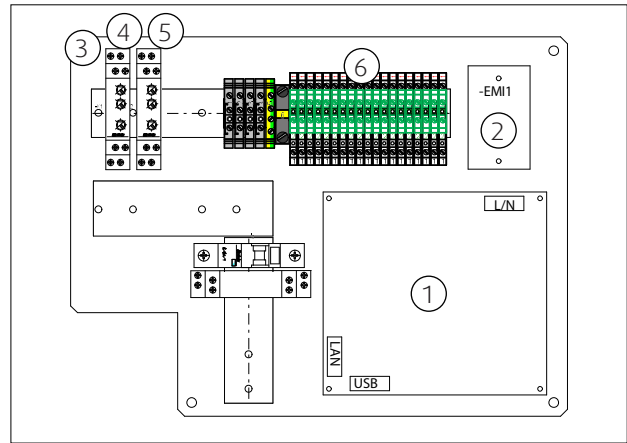
### Caution

- Service switch must be turned off before working on the unit.
- The electrical installation must be done pursuant to the technical documentation and by a certified electrician. The unit installation should be done by a qualified technician with experience in electrical applications. The manuals must be observed, together with the laws and regulations applicable in the country.
- The wiring diagrams located on the product have a higher priority than those in manuals. In case of doubt, contact the supplier before performing any work on the product.
- The unit must be connected to the main power source via isolated cable in compliance with the diameter and the applicable laws and regulations of the country where the unit is installed.
- Any altering or changes to the internal connections of the unit are forbidden and may result in the loss of warranty.
- Only using of original components guarantees the correct function of the product.

## 11.1 Electric power cable

Electric supply cable and HMI cable are not included! It has to be installed before the commission. Choose the type and thickness of the cable according to the product's maximum power consumption and the specific requirements of the place of installation.

All the product's electrical circuits must be connected through an residual current device (RCD) switch according to regulations of the country where the unit is installed. The product must be installed together with an emergency switch.



Position	Description
1	Controller
2	EMI filter
3	DC power supply (24V)
4	6A fuse for fan, controller, pump
5	Contactor for electric heaters (depend on options)
6	Terminal blocks

### Wiring power lines

Use standard stranded cable and wiring. The ends can be connected directly or strengthened with conductor sleeves or pin connectors.

- Min. 0,5 mm<sup>2</sup>/AWG 24
- Max. 2x1,5 mm<sup>2</sup>/AWG16 or 1x 2,5 mm<sup>2</sup>/AWG13 Set the torque to 0,5 - 0,6 Nm
- Supply cables must be secured with cable restraints
- The AC 230 V installation must guarantee that the voltage is at least 230 V - 15% (196 V) at the controller.

### Ethernet network

Building automation and control systems must use a separate technical network with very restricted and selective connection to the rest of the intranet and no connection at all to the internet. This can be done using a VLAN or a separate subnet.

Standard Ethernet cable (min. category 5)

- STP (Shielded twisted pair)
- Length between switch and room automation station: Max. 100 m
- Length between room automation stations: Max. 30 m
- Number of devices in a line topology: Max. 20
- Standard IT product at 100 MB
- BACnet on IP network
- Max. length between two room automation stations: 500 m
- Max length for stubs: 30 m
- Max. cable length of an MS/TP segment (including stubs): 1000 m
- Long distances can be spanned using routers.
- MODBUS
- Low slew rate 1/8-unit load transceiver

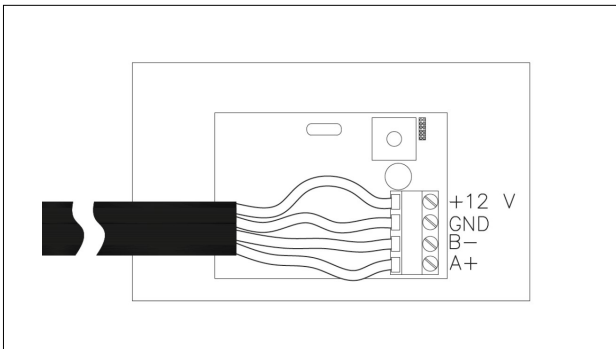
- Baud rate: 1200/2400/4800/9600/19200/38400/57600/76800/115200 bps
- Cable length: 30 m max.
- Modbus slave mode can be activated/deactivated by the ABT tool, default value is deactivated

### Wiring diagram

The wiring diagram is included in the delivery of the product. Each size and heating type has different execution of wiring.

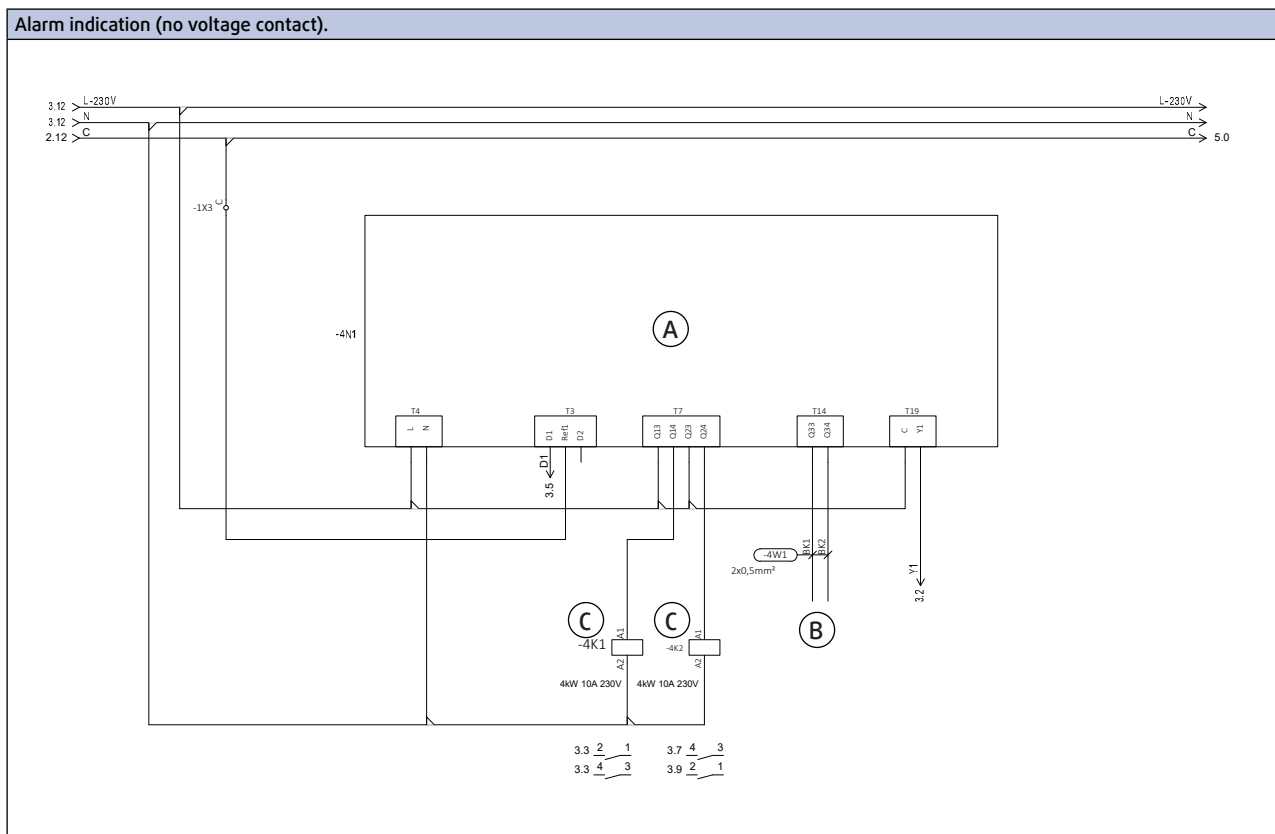
## 11.2 To connect the HMI display

Use 4-wire cable or UTP 5e cable for HMI connection.



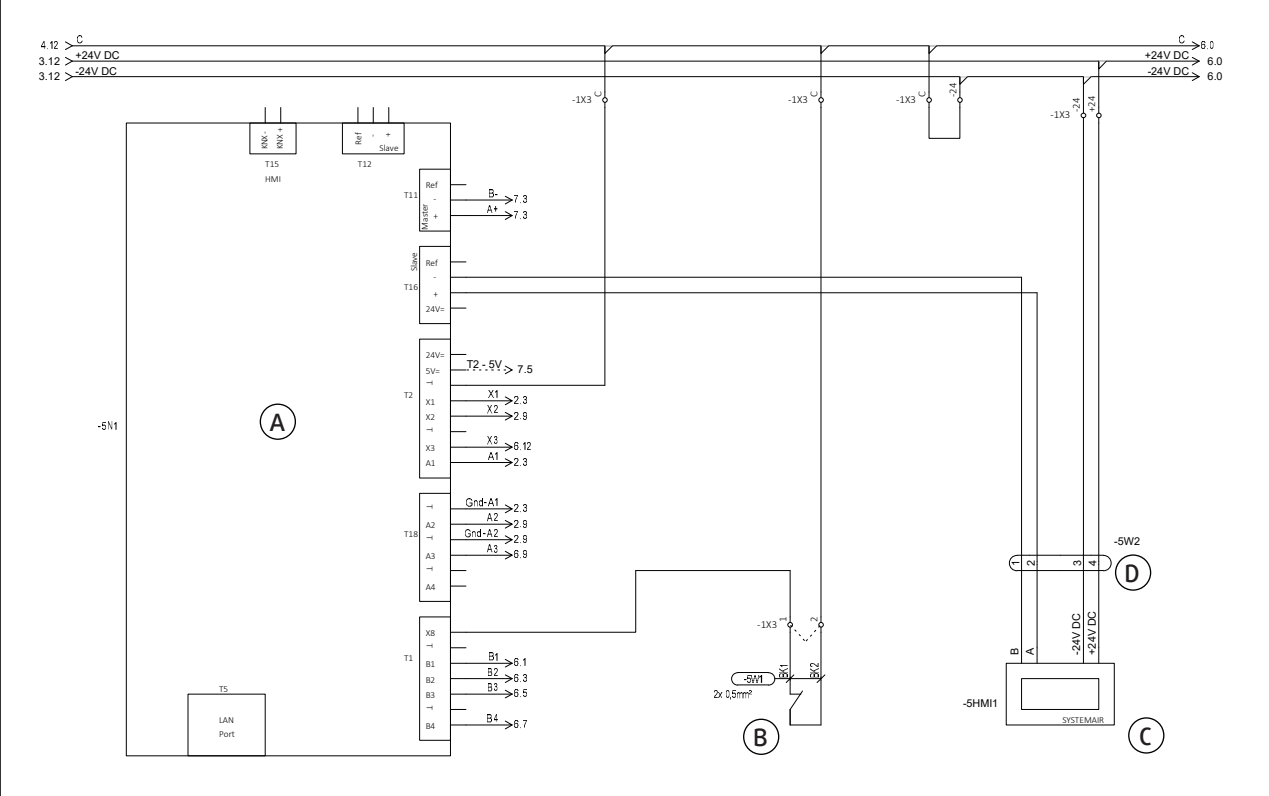
Insert the other side of the cable into the electrical cabinet as described in chapter 5.4. and connect it according to the wiring diagram.

## 11.3 External connection



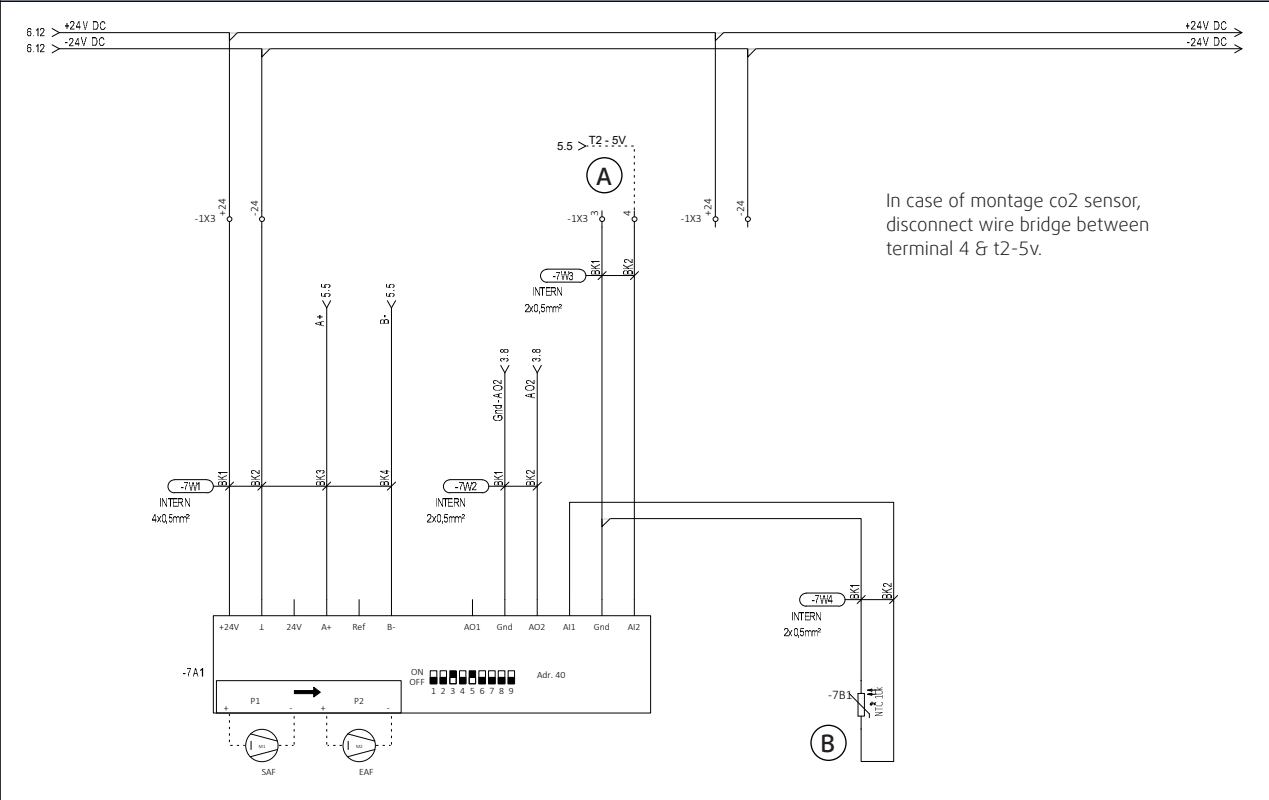
A. High power supply      B. Alarm indication (voltage-free contact)      C. Contactor

**Fire alarm (Terminal block 1 and 2), HMI (user display), Modbus RTU 485 (T12 terminal), LAN port (BACnet)**



- A. Low power supply
- B. Fire alarm
- C. HMI
- D. Shield 4x0,5 mm<sup>2</sup>

**CO2 sensor (terminal block 3 and 4).**



- A. CO<sub>2</sub> sensor (optional)
- B. Extract air temperature



## 12. EU Declaration of Conformity

### We, the manufacturer

<b>Manufacturer</b>	Systemair d.o.o.
<b>Address</b>	Špelina ulica 2 2000 Maribor Slovenia

### declare under our sole responsibility that the products

<b>Type/Model</b>	Sense SNX
<b>Identification</b>	Serial numbers dating from 2022 and onwards

### fulfils the relevant provisions of following directives and standards

#### Machinery Directive 2006/42/EC

##### **EN ISO 12100:2010**

Safety of machinery – General principles for design - Risk assessment and risk reduction

##### **EN ISO 13857:2019**

Safety of machinery – Safety distances to prevent hazard zones being reached by upper or lower limbs

##### **EN 60204-1:2018**

Safety of machinery – Electrical equipment of machines – Part 1: General requirements

##### **EN 60335-1:2012**

Household and similar electrical appliances – Safety Part 1: General requirements.

##### **EN 50106:2008**

Safety of household and similar appliances – Particular rules for routine tests referring to appliances under the scope of EN 60335-1.

##### **EN 60529:2014**

Degrees of protection provided by enclosures (IP Code).

#### Directive electromagnetic compatibility (EMC) 2014/30/EU

##### **EN 62233:2008**

Measurement methods for electromagnetic fields of household appliances and similar apparatus with regard to human exposure.

##### **EN 61000-6-1:2019**

Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments.

##### **EN 61000-6-4:2018**

Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments.

##### **Ecodesign Directive 2009/125/EC**

327/2011 Requirements for fans

1253/2014 Requirements for ventilation units

##### **EN 13053:2019**

Ventilation for buildings – Air handling units – Rating and performance for units, components and sections.

Ventilation for buildings – Components/Products for residential ventilation – required and optional performance characteristics.

Persons authorized to compile the technical file:

##### **Marko Petkovski**



R&D Manager

This declaration relates exclusively to the machinery in the state in which it was placed on the market and excludes components which are added or operations carried out subsequently by the final user.

Maribor, Slovenia 2022-07-15



**Anton Zupančič**

Managing Director

## 13. UK Declaration of Conformity

### We, the manufacturer

<b>Manufacturer</b>	Systemair d.o.o.
<b>Address</b>	Špelina ulica 2 2000 Maribor Slovenia

### declare under our sole responsibility that the products

<b>Type/Model</b>	Sense SNX
<b>Identification</b>	Serial numbers dating from 2022 and onwards

### fulfils the relevant provisions of following directives and standards

#### Supply of Machinery (Safety) Regulations 2008

##### **EN ISO 12100:2010**

Safety of machinery – General principles for design - Risk assessment and risk reduction

##### **EN ISO 13857:2019**

Safety of machinery – Safety distances to prevent hazard zones being reached by upper or lower limbs

##### **EN 60204-1:2018**

Safety of machinery – Electrical equipment of machines – Part 1: General requirements

##### **EN 60335-1:2012**

Household and similar electrical appliances – Safety Part 1: General requirements.

##### **EN 50106:2008**

Safety of household and similar appliances – Particular rules for routine tests referring to appliances under the scope of EN 60335-1.

##### **EN 60529:2014**

Degrees of protection provided by enclosures (IP Code).

#### Electromagnetic Compatibility Regulations 2016

##### **EN 62233:2008**

Measurement methods for electromagnetic fields of household appliances and similar apparatus with regard to human exposure.

##### **EN 61000-6-1:2019**

Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments.

##### **EN 61000-6-4:2018**

Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments.

#### **The Ecodesign for Energy-Related Products and Energy Information (Amendment) (EU Exit) Regulations 2019**

327/2011 Requirements for fans

1253/2014 Requirements for ventilation units

##### **EN 13053:2019**

Ventilation for buildings – Air handling units – Rating and performance for units, components and sections.

Ventilation for buildings – Components/Products for residential ventilation – required and optional performance characteristics.

Persons authorized to compile the technical file:

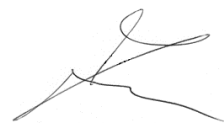
#### **Marko Petkovski**



R&D Manager

This declaration relates exclusively to the machinery in the state in which it was placed on the market and excludes components which are added or operations carried out subsequently by the final user.

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